

# Proceedings of the Iowa Academy of Science

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Volume 55 | Annual Issue

Article 20

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1948

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### Recommended Citation

Hayden, Ada (1948) "The Iowa Lakeside Laboratory - A Prairieless Field Laboratory," *Proceedings of the Iowa Academy of Science*, 55(1), 163-170.

Available at: <https://scholarworks.uni.edu/pias/vol55/iss1/20>

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## The Iowa Lakeside Laboratory—A Prairieless Field Laboratory

ADA HAYDEN

### The Effects of Unplanned Tillage.

Iowa is a prairie state and thus her institutions and students must wrestle with problems growing out of prairie environment. Slightly more than a hundred years ago, about five-sixths of the state consisted of virgin grassland. For thousands of years the prairie vegetation together with air, weather, and water in the course of time, has been making soil; as season after season, organic matter has been deposited among the particles of pulverized rock.\* Most of the prairie which lived in centuries past, now lies below the surface of the soil; and with the removal of the sod by cultivation, the natural soil building process has ceased;—ceased before man has learned the intricate sequences involved. During more than one-hundred years of cultivation, the sodless prairie-made soil of Iowa has been slipping down the waterways.

The lands of northern Iowa are not so badly depleted as those of southern Iowa where one-third of the state is undergoing experimental treatment for the recovery of depleted soils. On some farms the land can no longer produce a living for the tenants or owners. Unless persons who own and operate land prevent erosion, it may be necessary for the government to assume jurisdiction over all of it before long, for countless tons of Iowa's rich top soils now lie without the borders of the state. Three out of nine inches have washed away in 100 years according to the soil survey. However, the efficiency of government control depends upon the sincerity and discernment of its workers. The researches of Aikman (1943), Brewer (1947), and his associates in their hill culture studies show that soil depletion can be halted and partial recovery can be prescribed though complete restoration has not been demonstrated.

### LAND USE, FIELD STUDY, AND CONSERVATION

A note of warning had been expressed by Macbride and Shimek concerning the use of lands in 1910. Kellogg (1916), Taylor (1916), Stevenson (1910-14), MacDonald (1916) and others publicized the desirability of conservation of our natural resources and the setting aside of protected tracts for observation and study.

In 1915, the first Report of a Conservation Committee in the Iowa Academy of Science was issued. The report of this committee of one, in the person of Dr. L. H. Pammel, related to an interview with the Governor, George W. Clark, concerning the appointment of a conservation board, which became a reality in 1917 (Pammel 1920).

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\*Jenny regards the soil system as the product of several independent variables or soil forming factors; including climate, organisms, topography, parent material and time.

As late as 1942, citizens, legislators, and boards of conservation had failed to heed the warnings issued by educators and investigators and no prairie had been reserved for scientific study.

During the first half century of Iowa's statehood, towns, cities, and avenues of transportation had sprung up and educational institutions were later established through wealth derived from tillage. By this time, the native plants and animals were rapidly disappearing in the southern part of the state where the first settlements occurred. Yet, in the morainal districts of the lake region representative native biota persisted and thus afforded a location where natural environments might still be scientifically studied.

#### THE FIELD LABORATORY METHOD

##### The Iowa Lakeside Laboratory

It was on Miller's Bay of Lake Okoboji (Fig. 1) that the Lakeside Laboratory was established in 1909, under the leadership of Professor Thomas H. Macbride of the University of Iowa. It was



Figure 1. Miller's Bay, Lake Okoboji. Photo by Ada Hayden.

the earliest attempt in the Middle West (on a non-commercial basis) to provide a place where the rich fauna and flora of the lake and prairie regions of northern Iowa could be studied and some principles, perhaps, derived for its proper use. For the past 38 years, the laboratory has been used as a field biological station by students of the State University of Iowa and other institutions. During this period the laboratory, financed largely by a group of interested alumni and friends, has been operated by the State University to supplement its teaching of the biological sciences.

In May, 1936, the Lakeside Laboratory was deeded in trust by the Iowa Lakeside Laboratory Association to the State of Iowa, for the

purpose of better insuring its perpetuation and carrying out of the ideas of its founders: "A station for the study and conservation of the water and of the flora and fauna of the state of Iowa." During this period a number of stone laboratory buildings and a library were constructed from slabs of granite boulders through the agency of the Works Progress Administration. (Figs. 2 and 3.) The title in 1947 was transferred to the Iowa State Board of Education.



Fig. 2. The library and laboratory buildings at the Iowa Lakeside Laboratory. Lake Okoboji in the background. Photo by Dr. Ferdinand Smith.



Figure 3. The Library. Photo by Dr. Ferdinand Smith.

### **A Prairieless Field Laboratory**

For nearly forty years the students of Iowa have had the privilege of a Prairie Study Center so situated that it was possible to work upon forest, prairie, and the ecotone zone of their overlapping borders. The state owns forest tracts in this vicinity but has never preserved any prairie in Dickinson County where the greatest variety

and acreage of the remaining prairie exists. There is, therefore, no controlled virgin grassland available where undisturbed experimentation can be carried on. A grazed bluegrass pasture which came into the possession of the Iowa Lakeside Laboratory in 1930 has been allowed to revert during the past eighteen years. (Fig. 4.) It has

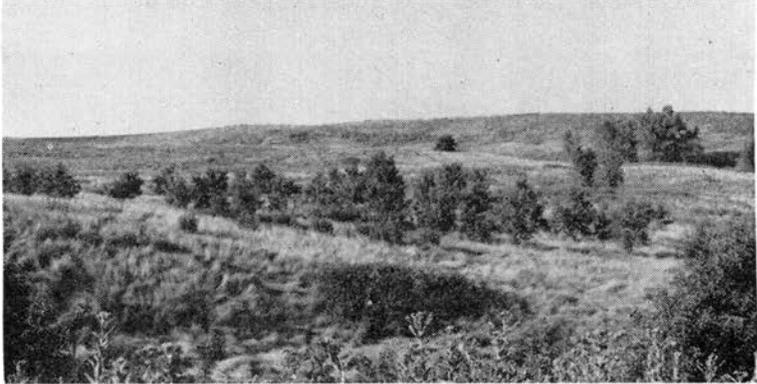


Fig. 4. A bluegrass pasture reverting to prairie. Invasion by box elders and cottonwoods. Photo by Dr. W. A. Anderson.

been the site of researches begun by Shimek and elaborated and published by Anderson (1947). Shimek's well known descriptive studies of Iowa prairie (1911, 1915, and 1925) were partly made in this vicinity and such existing areas should be preserved as type specimens for scientific reference. (Figs. 5 and 6).

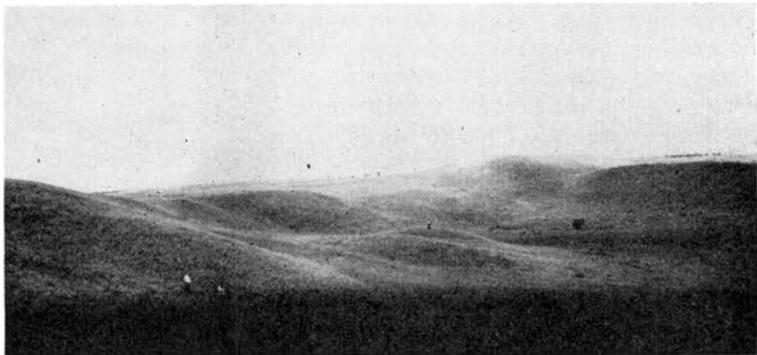


Fig. 5. A field laboratory in northwestern Iowa where students from the Lakeside Laboratory of the University of Iowa, on Lake Okoboji, are studying the shortgrass prairie transformed from the tall grass stage by grazing cattle. In the foreground, a kettlehole pond, a relic of glacial action, furnishes an environment for aquatic plants. Photo by Dr. W. A. Anderson).



Fig. 6. A Kettle hole pond in a chain of morainal hills which border the Little Sioux River seen in the distance. Photo by Ada Hayden.

#### A COOPERATIVE EFFORT TO ESTABLISH PRAIRIE STUDY CENTERS.

##### **Lack of Grassland Preserves for Study**

Many well directed, but fruitless efforts toward acquiring virgin grassland for other than agricultural use has placed Iowa in the same category of experience as her neighboring states, including Illinois, Nebraska, North Dakota, Arizona, Oklahoma and Texas. These states have thus far vainly tried to acquire sites of virgin prairie in order that problems confronting the economic welfare of existing civilization may be explored and proper methods of land use and management of the biota be formulated and put into practice.

##### **Grassland Studies of the National Research Council**

The recurrence of unfavorable weather cycles has served to demonstrate the inability of misused grassland to recover its productivity. The drought, duststorms, overgrazing, and distressing economic conditions in the North American Grassland area which prevailed during the 30's served to bring widespread attention to the numerous serious problems of this area. Because of the gravity of these problems, involving our national economy, several groups of scientific persons turned their attention to the prairie and plains. The Committee on the Ecology of the Grasslands of the National Research Council was such a group. It had been considering for several years ways and means for aid in the solution of these prob-

lems, for it was convinced that inadequate knowledge of grasslands is one of the underlying causes for widespread erosion, misuse, and poverty throughout the plains and prairies.

This group recognized that fundamental investigations must be conducted in grasslands as they have been conducted in such fields as forestry, medicine, and oceanography before planning and management of our valuable grasslands can be placed upon a scientific basis. Until a scientific basis is established widespread suffering and lack of harmony between controlling factors and the people will prevail. These difficulties arise from the fact that there have not been scientific studies of grassland in any way comparable to those which have been made for forests and croplands of the humid regions.

### **The Grassland Research Foundation**

As a result of the efforts of the committee on Ecology of Grasslands of the National Research Council, an organization known as the Grassland Research Foundation, Inc., was established. This society was to have been incorporated in Iowa, but the laws of Oklahoma were more favorable, because they permitted the corporation to hold land on Oklahoma or elsewhere. Among the objectives for which the corporation was formed are the following: (1) To secure a dues-paying membership of sufficient size to provide for necessary correspondence with attempts to secure gifts and promote legislative action favoring the study of grasslands, (2) To provide a body which may receive gifts, grants of all kinds, and disburse them for the furtherance of grassland research facilities, and in assisting worthy investigators with their work. (3) To improve the quality and extend the scope of instruction in grassland ecology.

The Grassland Research Foundation, Inc., was organized in 1939 by scientists interested in grassland research with the tacit approval of the Chairman of the Division of Biology and Agriculture of the National Research Council and the Chairman of its Committee on grassland. It is mentioned here, because it sought to forward by the means mentioned this much needed program of research. The second International War caused the organization to be inactive by a vote of common consent during that period. The Corporation, in 1944, resumed activities and a new committee on the Ecology of Grasslands is to be organized by the National Research Council.

By trial and error some facts about acquiring grassland have been learned. Experience has shown that in many cases gifts and grants made directly to state universities prove to be an endowment for the state rather than the institution, because he legislators cut the appropriation in proportion to the amount of income that may be secured from other sources. This experience should indicate that a disbursing corporation is really an important part of a successful cooperative research group.

**National Research Council Study Centers**

National Research Council Study Centers were located in and about the University of Arizona, the University of Texas, the University of Illinois, the University of Oklahoma, the University of Nebraska, the State University of Iowa, North Dakota Agricultural College, and the University of Saskatchewan. The institutions named have been responsible for extensive studies of grassland in areas of fairly dense population, and the research done by them might readily be correlated with those of the Federal Government and more westerly institutions which lie near to, and in the mountainous regions.

**THE NEEDED PRESERVE OF VIRGIN PRAIRIE**

It has been shown that although the Iowa Lakeside Laboratory was organized as a local institution, that potentially it has an important educational contribution to make to the knowledge of grassland so significant in combatting the forces of drought, erosion, overgrazing, and improper use of land, not only in Iowa, but throughout the Grassland Province. The Iowa State Legislature has judiciously provided funds for the acquisition of six areas of virgin prairie representing the major soil association of Iowa as outlined by the Iowa State Conservation Commission in the postwar program (1946) of realization of its Twenty-five Year Plan (1933). This plan for acquisition of prairie was approved and sponsored by the Iowa Academy of Science.

It is further recommended to the Conservation Committee of the Iowa Academy of Science as a part of their 'Project for Conservation of Prairie,' that a measure be formulated petitioning the General Assembly of Iowa for funds to purchase lands suitable for a permanent virgin prairie preserve for the Iowa Lakeside Laboratory, and that a bill be drafted and presented outlining the need for existing tracts which have already been described in the Iowa Prairie Survey (Hayden 1948) from which type specimens could be specified to satisfy the variety of topography and vegetative aspects and soil types represented in the type specimens to be recommended.

The photographs of the buildings at the Lakeside Laboratory were furnished by the courtesy of the director, Dr. J. H. Bodine.

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